

Master Thesis projects at Nordic Bioscience – Department of Diabetes:

Exploring novel treatment possibilities for type 2 diabetes

– focusing on therapeutic peptides

Introduction

Type 2 diabetes is characterized by a chronic hyperglycemic state, primarily due to defective insulin secretion and peripheral insulin resistance. Furthermore, the majority of type 2 diabetic patients are obese, which itself is a major risk factor for insulin resistance and type 2 diabetes. Therefore, anti-diabetic therapy should optimally target all of these dysfunctions and recently analogues resembling the action of gut-derived peptides have demonstrated efficacy as novel therapeutic agents in obesity and type 2 diabetes. Recently, we demonstrated that oral delivery of gut peptides markedly improved the hyperglycemic state and reduced body weight in obese diabetic rodents (Feigh M et al. 2011, 2012) and we are now investigating the mechanisms of action for the glucoregulatory effect. This involves both *in vivo* and *in vitro* experiments in rodent models of type 2 diabetes and tissue involved in glucose regulation (e.g. skeletal muscle, adipose tissue, liver) and insulin secretion (pancreas).

Aims of the project:

- Perform *in vivo* animal studies investigating the glucoregulatory effects of therapeutic peptides.
- Establish *in vitro* models of skeletal muscle and adipose tissue for pharmacological testing and mechanism of action studies.
- Investigate tissue of interest regarding morphology and regulation by *in vivo* intervention.

Methods:

In vivo models: Diet-induced obese rats and mice and Zucker Diabetic Fatty rats – metabolic testing and evaluation.

In Vitro models: Isolation, culture and pharmacological treatments of primary skeletal muscle cells and adipocytes. Glucose metabolism studies.

Morphology: Histological and tissue techniques for evaluation of skeletal muscle and adipose tissue from pharmacological *in vivo* studies.

Description of the company:

Nordic Bioscience is a biotech company doing research in several disease areas: osteoporosis, arthritis, cardio vascular diseases, fibrotic diseases, alzheimer's and diabetes. The student will be a part of a very dynamic and young team, with a high publication rate. We offer an attractive research climate with several master and PhD students. In return, a high level of engagement is expected from the student.

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